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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/342,348 | 06/29/1999 | TIMOTHY J. BROSNIHAN | 07043/060002 | 6423 |

26181 7590 01/23/2003

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REDWOOD CITY, CA 94063

EXAMINER

MAI, ANH D

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2814

DATE MAILED: 01/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/342,348

Applicant(s)

BROSNIHAN ET AL.

Examiner

Anh D. Mai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Prosecution Application

1. The request filed on October 25, 2002 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/342,348 is acceptable and a CPA has been established. An action on the CPA follows.

Amendment

2. Amendment filed August 28, 2002 has been entered as Paper No. 11. Claims 1 have been amended. Claims 1-12 are pending.

Response to Amendment

3. The amendment filed August 28, 2002 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: "the first trench electrically isolating elements of the microstructure from each other".

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one

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skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There does not appear to be a written description of the claim limitation "the first trench electrically isolating elements of the microstructure from each other" in the application as filed.

As shown in the specification, the first trench (60) is formed to isolate the microstructure (14) from the circuit (12). Clearly, the first trench (60) does not electrically isolating elements (30/32) of the microstructure (14) from each other.

As best understood by the examiner, the first trench is electrically isolating elements of the microstructure (first region) from the circuit (second region).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bashir et al. (U.S. Patent No. 5,747,353) in view of Hunter et al. (U.S. Patent No. 4,631,803) (all cited previously).

With respect to claim 1, as best understood by the examiner, Bashir teaches a method of fabricating a microelectromechanical system substantially as claimed including:

providing a substrate (100) having a device layer (106);

etching a first trench (121) in the device layer (106), the first trench surrounding a first region of the substrate;

forming a dielectric isolation layer in the first trench (121) to electrically isolate the first region from a second region of the substrate (106); and

etching a second trench (120) in the device layer (106), the second trench located in the first region and defining a microstructure, and the first trench (121) electrically isolating elements of the microstructure (first region) from the circuit (second region). (See Figs. 1-9).

Note that, the dielectric isolation layer of Bashir is formed by thermal oxidizing the exposed device layer (106) followed by depositing a polysilicon layer (similar to that of the present invention, page 12, line 27).

Thus, Bashir is shown to teach all the features of the claim with the exception of depositing the dielectric isolation layer.

However, Hunter teaches forming a trench isolation including: depositing a dielectric isolation layer (40) in the trench (36) followed by depositing a filler layer (42) to electrically isolate the first region from the second region of the substrate. (See Fig. 2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to form the isolation trench structure of Bashir by depositing a dielectric isolation layer (40) in the first trench (121) prior to filling the trench as taught by Hunter to eliminate the formation of defects in the surrounding semiconductor substrate.

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With respect to claim 2, the method of Bashir further includes forming circuitry in a second region of the substrate outside the first region.

With respect to claim 3, Bashir teaches deposition of a metal layer, patterning of the metal layer to define the contacts. (See col. 5, ll. 39-50).

Thus, Bashir is shown to teach all the features of the claim with the exception of explicitly disclosing the connection of the microstructure to the circuitry.

However, Bashir clearly implies the formation of the metal layer is to connecting the microcircuit to the control circuit in the second region.

With respect to claim 4, the method of Bashir or Hunter further comprising depositing a filler material (poly or 42) over the isolation layer in the first trench (121 or 36).

With respect to claim 5, wherein the isolation layer (40) of Hunter fills the first trench (36).

With respect to claim 6, wherein the substrate (100) of Bashir further includes a handle layer (102) and a sacrificial layer (104).

With respect to claim 7, wherein the method of Bashir further includes removing a portion of the sacrificial layer (104) to release the microstructure (142/144).

With respect to claims 8 and 9, wherein the step of etching the first (121) and second (120) trenches of Bashir etches through the device layer (106) to expose the sacrificial layer (104).

With respect to claim 10, wherein the sacrificial layer (104) of Bashir includes silicon dioxide.

With respect to claim 11, wherein the device layer (106) of Bashir includes epitaxial silicon.

With respect to claim 12, the isolation layer (40) of Hunter includes silicon nitride.

Response to Arguments

6. Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

Note that, Fig. 10 of Bashir is to show the masks for the process. One having ordinary skill in the art should have recognized that the electrodes (movable electrode (142) and stationary electrode) of an accelerometer are electrically isolated from each other. The connections for these are shown in Fig. 14.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh D. Mai whose telephone number is (703) 305-0575. The examiner can normally be reached on 8:30AM-5:00PM.

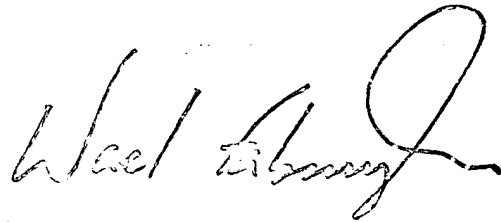
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A.M

January 16, 2003

A handwritten signature in black ink, appearing to read "Wael Elbany". The signature is fluid and cursive, with a large loop at the end.

SUPERVISORY PRIMARY EXAMINER
TECHNOLOGY CENTER 2800